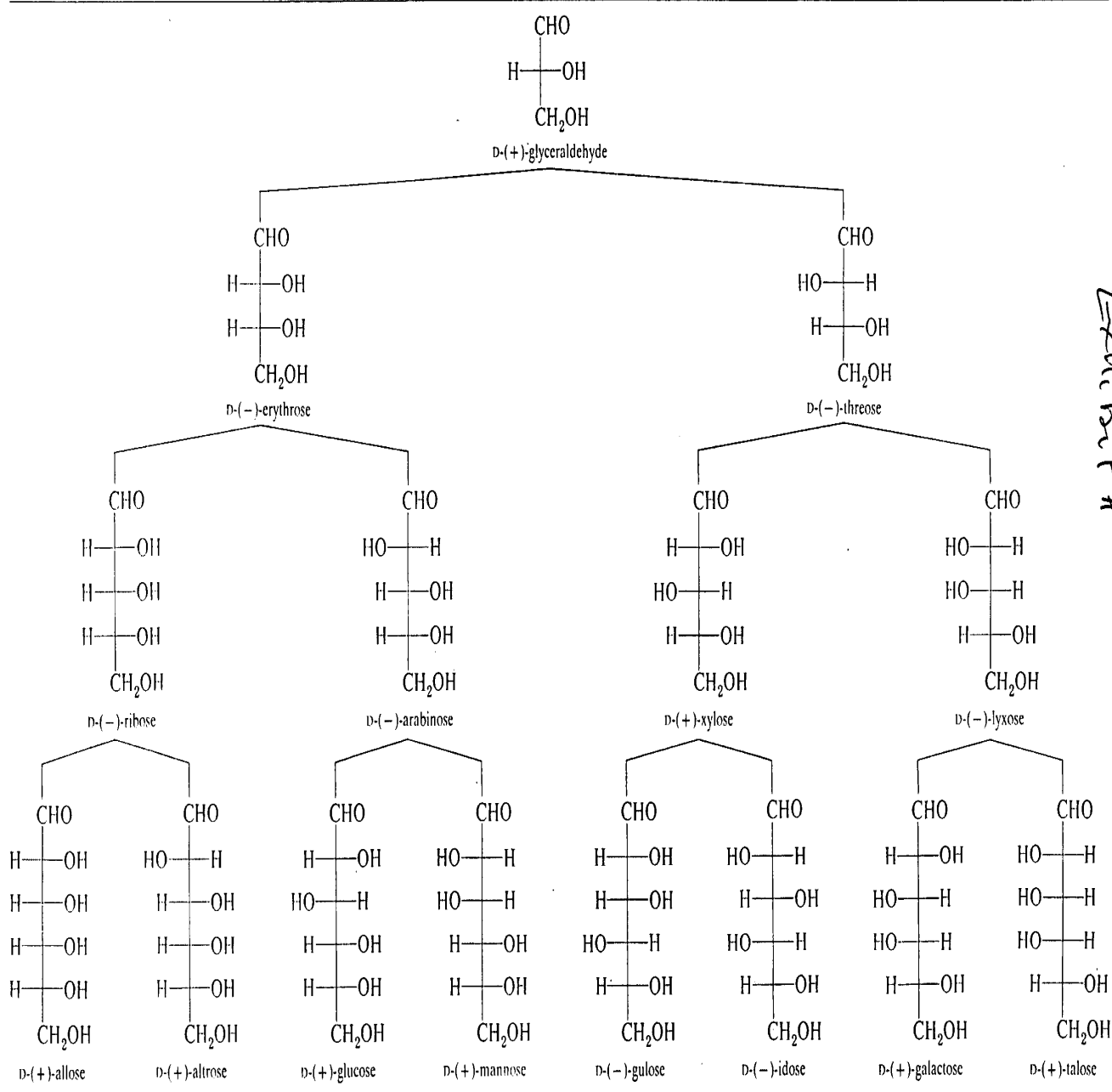
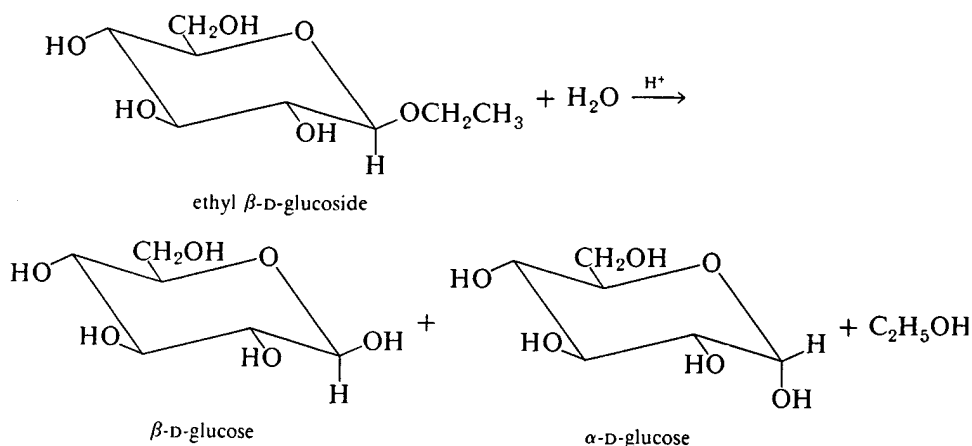


TABLE 25.1
The D-Family Aldoses

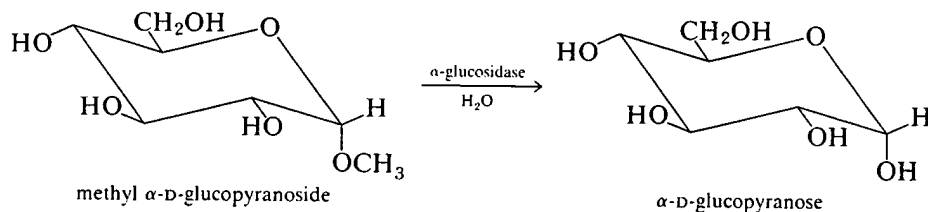


Chap. 25
Carbohydrates

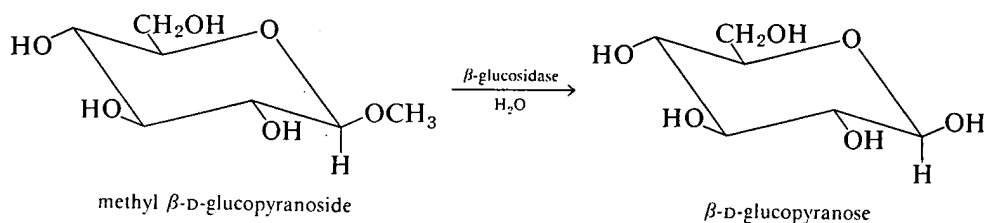
present in excess, the equilibrium shifts and hydrolysis occurs. Of course, under acidic conditions a mixture of the anomeric sugars results.



The hydrolysis of glycosides may also be brought about by certain **enzymes**. Enzymes are complex natural products, mainly protein in nature (Chapter 28), which function as catalysts in biological reactions. They are extremely potent catalysts, often speeding up reactions by factors as large as 10^{10} . They also show remarkable structural specificity, as shown by the present example. Methyl α -D-glucopyranoside is hydrolyzed in the presence of an enzyme isolated from yeast, called α -glucosidase. This particular enzyme only catalyzes the hydrolysis of α -glucoside linkages; methyl β -D-glucopyranoside is unaffected by it.



Another enzyme, β -glucosidase from almonds, has opposite properties; it only catalyzes the hydrolysis of β -glucosides.



Similar enzymes are known that specifically catalyze the hydrolysis of α - and β -galactosides (α - and β -galactosidase) and other glycosidic bonds. These enzymes are very useful in determining the stereochemistry of the glycoside links in oligosaccharides and polysaccharides (Sections 25.7 and 25.8).

25.4

Conformations of the Pyranoses

As has been tacitly implied in the structures used thus far in this chapter, the pyranose forms of sugars exist in a chair conformation similar to the stable